

Remarks/Arguments

Favorable consideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-2, 4-8, and 12-16 are pending in this application, with Claims 1 and 4-6 amended, Claims 9-10 cancelled and Claims 12-16 added by the present amendment.

In the Office Action of August 28, 2003, Claims 4 and 5 were objected to; Claims 6, 9, and 10 were rejected under 35 U.S.C. § 112, second paragraph; Claims 1 and 4-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by Mandella et al. (U.S. Patent No. 5,887,009, hereinafter Mandella); and Claims 2 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mandella in view of Fermann et al. (U.S. Patent No. 5,818,630, hereinafter Fermann).

Claims 4 and 5 are amended to correct the error noted in the Official Action.

Applicants acknowledge with appreciation the personal interview between the Examiner, the Examiner's supervisor, and Applicants' representative on February 18, 2004. During the interview, the Examiner and his supervisor acknowledged that Mandella, Fermann, and Waarts (cited in an earlier Official Action) do not disclose or suggest Applicants' holographic spatial mode conversion device. However, to clarify the claimed invention, the Examiners suggested amending Claim 1 to recite the holographic spatial mode conversion device in means-plus-function format per 35 U.S.C. § 112, sixth paragraph. Also, the Examiners suggested amending Claim 6 to clarify that the optical splitter splits a return beam as shown at least in Figure 1a.

Claims 1 and 6 are amended as suggested by the Examiners during the interview of February 18, 2004. New Claim 12, dependent from Claim 1, is directed to alternative

embodiments of Applicants' claimed holographic spatial mode conversion means as disclosed in Applicants' originally filed specification.¹ New Claims 13-16 correspond to original Claims 9-11, rewritten in keeping with the Examiners' suggestions of February 18, 2004. No new matter is added.

Briefly recapitulating, independent Claim 1 is directed to a pumped fiber laser, comprising a multimode doped fiber having a first and second end; *a holographic spatial mode conversion means* configured to receive light from the multimode doped fiber; and a monomode laser oscillator configured to transmit a monomode laser beam to the first end of said multimode doped fiber. The holographic spatial mode conversion device recited in Claim 1 ensures coherent transfer of energy emitted in a spatial mode² by converting multimode beams into monomode beams³ so the laser is able to produce high power beams with good beam quality to compact and efficient fibers.⁴

Mandella teaches a fiber laser based confocal scanning system 10 including a focusing lens 30, where the focusing lens 30 may be a holographic optical element (HOE).⁵ However, Mandella does not teach or suggest *a holographic spatial mode conversion means* as recited in Applicants' Claim 1. Mandella does not teach a mode conversion device of any type, let alone a holographic spatial mode conversion device as recited in Applicants' Claim 1.

Fermann discloses a method and apparatus for amplifying and compressing optical pulses in a multi-mode fiber including a mode converter (50) configured to match a mode of an incoming beam to a mode of the multi-mode fiber.⁶ However, like Mandella, Fermann does not teach or suggest *a holographic spatial mode conversion means* as recited in Applicants'

¹ Specification, page 4, line 10 – page 5, line 22.

² Specification, page 6, lines 8-10

³ Specification, page 4, lines 20-36.

⁴ Specification, page 1, lines 5-10.

⁵ Mandella, column 7, lines 55-62.

amended Claim 1. Thus, Applicants submit Fermann does not cure the deficiencies of Mandella.

As none of the cited prior art, individually or in combination, disclose or suggest all the elements of independent Claim 1, Applicants submit the inventions defined by Claim 1, and all claims depending therefrom, are not anticipated and are not rendered obvious by the asserted prior art for at least the reasons stated above.⁷ For substantially similar reasons, Applicants submit that the inventions recited in Claims 12-16 also are not anticipated and are not rendered obvious by the asserted prior art.

Accordingly, in view of the present amendment and in light of the previous discussion, it is respectfully submitted that the application is believed in condition for allowance and early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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⁶ Fermann, abstract, Figures 5 and 6.

⁷ MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."